IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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CASE NO.	RSW920000169US1	Group Art Unit: 2145
		Confirmation No. 1006
TITLE:	IMPROVED NETWORK ADDRESS TRANSLATION AND PORT MAPPING	

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MAIL STOP APPEAL BRIEF-PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attention: Board of Patent Appeals and Interferences

APPELLANTS' BRIEF

This Appeal Brief is in furtherance of the Notice of Appeal filed in this case on December 15, 2006. A pre-appeal conference decision was mailed on January 30, 2007, indicating the rejections of Claims 1-21 were withheld; thus, the due date for filing the Appeal Brief was extended to one month after the mailing of the decision. A petition requesting an additional one month extension is filed concurrently authorizing the extension fee to be paid to a credit card, thereby extending the deadline for response to March 30, 2007. The Commissioner is authorized to charge the fee for filing of this Appeal Brief to Deposit Account No. 09-0461.

1. REAL PARTY IN INTEREST

The present application is assigned to International Business Machines Corporation, having its principal place of business at New Orchard Road, Armonk, New York 10504. Accordingly, International Business Machines Corporation is the real party in interest.

2. RELATED APPEALS AND INTERFERENCES

The Appellants, assignee, and the legal representatives of both are unaware of any other appeal or interference which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

3. STATUS OF CLAIMS

A. Claims canceled: None

B. Claims withdrawn from consideration but not canceled: None

C. Claims pending: 1-21

D. Claims allowed: none

E. Claims rejected: 1-21

F. Claims appealed: 1-21

Appealed claims 1-21 as currently pending are attached as the Claims Appendix hereto.

4. STATUS OF AMENDMENTS

A Request for Continued Examination under 37 C.F.R. §1.114 was filed on March 13, 2006 in which claim amendments were made. In response, the Examiner indicated the claim amendments were entered and issued a non-final Office Action on June 5, 2006. A Reply under 37 C.F.R. §1.112 was filed on September 5, 2006: no claim amendments were made. In response, the Examiner issued the final Office Action appealed herein.

5. SUMMARY OF THE CLAIMED SUBJECT MATTER

Claim 1: A method of processing a client packet sent from a client to a NAT system including a NAT machine and a plurality of servers, said NAT machine performing an inbound translation on said client packet and forwarding said translated client packet to one of the plurality of servers, the method comprising the steps of: preparing, by said one of the plurality of servers, a response packet responsive to the client packet (Figure 3, step S1; page 7, lines 5-8); performing, by said one of the plurality of servers, a translation operation on the response packet to produce a translated response packet (Figure 3, step S3; page 7 lines 10-12); and transmitting the translated response packet directly to the client from said one of the plurality of servers, thereby bypassing the NAT machine (Figure 3, step S4; page 7 lines 12-16).

Claim 9: A NAT (Network Address Translation and Port Mapping) system comprising:

a NAT machine for receiving a client packet from a client, performing an inbound translation on the client packet to produce a translated client packet (page 5, lines 18-20), and sending said translated packet to one of a plurality of servers coupled to the NAT machine (page 6 lines 1-4), said one of the servers receiving the translated client packet and preparing a response packet responsive to the translated client packet (Figure 3, step S1; page 7, lines 5-8), said one of the servers including an outbound translation module for performing a translation operation on the response packet to produce a translated response packet (Figure 3, step S3; page 7 lines 10-12) and for transmitting the translated response packet directly to the client, thereby bypassing the NAT machine (Figure 3, step S4; page 7 lines 12-16).

Claim 15: A computer program product embodied on computer readable media readable by a computing device, for processing a client packet sent from a client to a NAT (Network Address Translation & Port Mapping) system including a NAT machine and a plurality of servers, said NAT machine performing an inbound translation on said client packet and forwarding said translated client packet to one of the plurality of servers, the product comprising computer executable instructions for: preparing, by said one of the plurality of servers, a response packet responsive to the client packet (Figure 3, step S1; page 7, lines 5-8); performing, by said one of the plurality of servers, a translation operation on the response packet to produce a translated response packet (Figure 3, step S3; page 7 lines 10-12); and transmitting the translated response packet directly to the client from said one of the plurality of servers, thereby bypassing the NAT machine (Figure 3, step S4; page 7 lines 12-16).

The present claimed invention discloses a method of processing a client packet in a network address translation (NAT) system. The invention first performs an initial packet address translation at the NAT machine, and then performs additional packet address translation at the individual servers, thereby allowing a direct connection between the clients and servers after the initial NAT translation. An inbound translation means the NAT machine receives the packet which is generically addressed to the entire system, and translates the address to specify a particular receiving server. The receiving server creates a response packet and translates this packet. This translation step includes adding a unique address to the packet, the unique address identifying the receiving server as opposed to the generic system address of the NAT machine. By performing this further translation step, the receiving server and client can now communicate directly without requiring further communication with the NAT machine.

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Appellants request the Board to review the following rejections:

1. The rejection of Claims 1-21 under 35 U.S.C. §102(e) as being anticipated by Borella et al. (U.S. Patent No. 6,353,614).

7. ARGUMENTS

The Examiner Has Not Established a *Prima Facie* Case of Anticipation

As set forth in the MPEP:

> A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.

MPEP §2131 citing *Verdegaal Bros. v. Union Oil Company of California*, 814 F.2d 628, 631, 2 U.S.P.Q. 2d 1051, 1053 (Fed. Cir. 1987).
MPEP 2131

1. The rejection of Claims 1-21 under 35 U.S.C. §102(e) as being anticipated by Borella.

As outlined in the Response filed September 5, 2006, differences between the present claimed invention and the prior art of record have been discussed extensively. Appellants believe that the Examiner has failed to meet all necessary requirements for making a prima facie anticipation rejection.

The present invention addresses the standard problem of "bottlenecking" in a Network Address Translation (NAT) system. Typically, traffic slows at a NAT machine due to the large volume of traffic being process by the NAT machine. The present claimed invention first performs an initial packet address translation at the NAT machine, and then performs additional packet address translation at any individual servers relaying information to a client machine, thereby allowing a direct connection between the clients and servers after the initial NAT translation. By utilizing this configuration, a large volume of traffic at the NAT machine is offloaded to individual servers after the initial address translation. Claim 1 specifically recites:

> preparing, by said one of the plurality of servers, a response packet responsive to the client packet;
> performing, by said one of the plurality of servers, a translation operation on the response packet to produce a translated response packet; and
> transmitting the translated response packet directly to the client from said one of the plurality of servers, thereby bypassing the NAT machine. (lines 5-10)

In these steps, the forwarded packet is processed at the receiving server. The receiving server creates a response packet and translates this packet. This translation step includes including a unique address for the receiving server as opposed to the generic system address. By performing this further translation step, the receiving server and client can now communicate directly without requiring further communication with the NAT machine, effectively bypassing the NAT machine. Each additional independent claim (Claims 9 and 15) recites a form of these limitations. This configuration is neither taught nor suggested by the prior art of record.

In contrast, Borella never reaches a point where communication is solely between a client and one of a plurality of servers, bypassing the NAT machine as is specifically claimed in the present invention. Borella discloses a system that is entirely dependent on NAT machine communication and port allocation. Borella Figure 9 and the accompanying descriptive text (Col. 8 line 63 through Col. 9 line 16) illustrate the initial address translation. Here, it is shown that each packet needing address translation requires a server to request a globally unique port from a NAT machine (in the example described by Borella, router 26 functions as the NAT machine). In Borella, the NAT machine pre-allocates a set of globally unique port numbers for each client. As each packet is sent out from a client to a destination outside the LAN, the server handling the transmission must request a new globally unique port from the NAT machine for addressing a response to the initially sent packets.

The Examiner asserts that column 12, lines 16-27 teaches the claimed limitation of "transmitting the translated response packet directly to the client from said one of the plurality of servers, thereby bypassing the NAT machine" (Claim 1, lines 9-10). However, the citation

quoted by the Examiner as teaching this limitation teaches the opposite of the Examiner's assertion. The citation specifically recites "Router **26** also routes data packets from the second external computer network back to a network device on the first computer network using the globally unique port in the combination network address" (Col 12, lines 16-19). While it is no longer performing the NAT process, the router (or the NAT machine of Borella) is still forwarding the packets. The present claimed invention bypasses the NAT machine altogether, establishing a direct connection between a server and a client. Figure 2 of the present invention clearly shows the connection established between the server and the client while completely bypassing the NAT machine. Borella, as shown in the above citation, never bypasses the NAT machine as the route of Borella is always used to direct traffic flow and never establishes a direct connection between the server and the client. Further, Figure 1 of Borella shows a topographical view of the system taught by Borella. As can be seen in Figure 1, there is no means of communication between a server and a client without using Router 26 for packet switching.

The Examiner has failed to show the necessary teaching in the prior art to anticipate the present invention. Each of the pending claims specifically recites the novel and non-obvious arrangement set forth above. The cited prior art fails to teach these novel features. Without such a teaching, it is inappropriate to reject the claims as being anticipated by the cited prior art.

8. CONCLUSION

For the foregoing reasons applicants respectfully request this Board to overrule the Examiner's rejections and allow Claims 1-21.

Respectfully submitted,

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Date

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CLAIMS APPENDIX

CLAIMS INVOLVED IN THIS APPEAL:

1. (Previously presented) A method of processing a client packet sent from a client to a NAT system including a NAT machine and a plurality of servers, said NAT machine performing an inbound translation on said client packet and forwarding said translated client packet to one of the plurality of servers, the method comprising the steps of:

preparing, by said one of the plurality of servers, a response packet responsive to the client packet;

performing, by said one of the plurality of servers, a translation operation on the response packet to produce a translated response packet; and

transmitting the translated response packet directly to the client from said one of the plurality of servers, thereby bypassing the NAT machine.

2. (Original) The method of claim 1, further comprising:

determining whether translation instructions are stored in said one of the servers;

executing the performing step if the determining step indicates that the translation instructions are stored in said one of the servers.

3. (Original) The method of claim 2, further comprising:

sending the response packet from said one of the servers to the NAT machine if the determining step indicates that the translation instructions are not stored in said one of the servers.

4. (Original) The method of claim 2, further comprising:

performing a translation operation on all subsequent response packets prepared by said one of the servers based on the translation instructions; and

transmitting the translated subsequent response packets directly to the client.

5. (Original) The method of claim 2, further comprising:

determining, by the NAT machine, if predetermined criteria have been satisfied for sending the translation instructions to said one of the servers; and

sending the translation instructions to said one of the servers if the predetermined criteria have been satisfied.

6. (Original) The method of claim 2, wherein the translation instructions identify information to be modified in a header of the response packet.

7. (Original) The method of claim 2, wherein the performing step includes:

evaluating a header of the response packet to identify a current IP destination address and a current destination port indicated in the header,

determining, using the translation instructions, a client IP address and a client port associated with the current IP destination address and the current destination port, and

modifying the header of the response packet to designate the client IP address and client port as the current IP destination address and the current destination port, respectively.

8. (Original) The method of claim 1, further comprising:

transmitting, by the NAT machine, instructions to stop the translation operation; and

transmitting, by said one of the servers, the response packet to the NAT machine according to said instructions.

9. (Previously presented) A NAT (Network Address Translation and Port Mapping) system comprising:

a NAT machine for receiving a client packet from a client, performing an inbound translation on the client packet to produce a translated client packet, and sending said translated packet to one of a plurality of servers coupled to the NAT machine, said one of the servers receiving the translated client packet and preparing a response packet responsive to the

translated client packet, said one of the servers including an outbound translation module for performing a translation operation on the response packet to produce a translated response packet and for transmitting the translated response packet directly to the client, thereby bypassing the NAT machine.

10. (Original) The system of claim 9, wherein said one of the servers determines whether translation instructions are stored in said one of the servers, performs the translation operation on the response packet if the translation instructions are stored in said one of the servers, and sends the response packet to the NAT machine if the translation instructions are not stored in said one of the servers.

11. (Original) The system of claim 10, wherein said one of the servers performs translation operations on all subsequent response packets prepared by said one of the servers based on the translation instructions, and transmits the translated subsequent response packets directly to the client.

12. (Original) The system of claim 10, wherein the translation instructions identify information to be modified in a header of the response packet.

13. (Original) The system of claim 10, wherein said one of the servers evaluates a header of the response packet to identify a current IP (Internet Protocol) destination address and a current destination port indicated in the header, determines, using the translation instructions, a client IP address and a client port associated with the current IP destination address and the current destination port, and modifies the header of the response packet to designate the client IP address and client port as the current IP destination address and the current destination port, respectively.

14. (Original) The system of claim 9, wherein the NAT machine transmits to said one of the servers instructions not to perform the translation operation on the response packet, and

said one of the servers transmits the response packet to the NAT machine according to the instructions.

15. (Previously presented) A computer program product embodied on computer readable media readable by a computing device, for processing a client packet sent from a client to a NAT (Network Address Translation & Port Mapping) system including a NAT machine and a plurality of servers, said NAT machine performing an inbound translation on said client packet and forwarding said translated client packet to one of the plurality of servers, the product comprising computer executable instructions for:

preparing, by said one of the plurality of servers, a response packet responsive to the client packet;

performing, by said one of the plurality of servers, a translation operation on the response packet to produce a translated response packet; and

transmitting the translated response packet directly to the client from said one of the plurality of servers, thereby bypassing the NAT machine.

16. (Original) The computer program product of claim 15, further comprising computer executable instructions for:

determining whether translation instructions are stored in said one of the servers;

executing the translation operation if the translation instructions are stored in said one of the servers; and

sending the response packet to the NAT machine if the translation instructions are not stored in said one of the servers.

17. (Original) The computer program product of claim 16, further comprising computer executable instructions for:

performing translation operations on all subsequent response packets prepared by said one of the servers based on the translation instructions; and

transmitting the translated subsequent response packets directly to the client.

18. (Original) The computer program product of claim 16, further comprising computer executable instructions for:

determining if predetermined criteria have been satisfied for sending the translation instructions to said one of the servers; and

sending the translation instructions to said one of the servers if the predetermined criteria have been satisfied.

19. (Original) The computer program product of claim 16, wherein the translation instructions identify information to be modified in a header of the response packet.

20. (Original) The computer program product of claim 16, wherein the computer executable instructions for performing the translation operation include computer executable instructions for:

evaluating a header of the response packet to identify a current IP (Internet Protocol) destination address and a current destination port indicated in the header,

determining, using the translation instructions, a client IP address and a client port associated with the current IP destination address and the current destination port, and

modifying the header of the response packet to designate the client IP address and client port as the current IP destination address and the current destination port, respectively.

21. (Original) The computer product of claim 15, further comprising computer executable instructions for:

transmitting, by the NAT machine, instructions to stop the translation operation; and

transmitting, by said one of the servers, the response packet to the NAT machine according to said instructions.

EVIDENCE APPENDIX

No additional evidence is presented.

RELATED PROCEEDINGS APPENDIX

No related proceedings are presented.